

## WHAT IS CLAIMED IS:

1. A high withstand voltage semiconductor device, comprising:
  - a substrate,
  - a semiconductor layer formed on an upper surface of the substrate,
  - a lateral semiconductor device formed in a surface region of the semiconductor layer and having a first principal electrode in its inner location and a second principal electrode in its outer location so as to let primary current flow between the first and second principal electrodes,
  - a field insulation film formed inside from the second principal electrode in an upper surface of the semiconductor layer to surround the first principal electrode,
  - a resistive field plate formed on an upper surface of the field insulation film to surround the first principal electrode and sectioned in a plurality of circular field plates in an approximate circular arrangement orbiting gradually from the vicinity of the first principal electrode toward the second principal electrode, the innermost one of the circular field plates being electrically connected to the first principal electrode while the outermost one is electrically connected to the second principal electrode, and the resistive field plate including coupling field plates which respectively connect adjacent ones of the circular field plates, and
  - a conductive field plate shaped in a floating island right above spaces defined between adjacent pairs of the plurality of circular field plates, an interlayer insulation film being interposed between the conductive field plate and the resistive field plate or the circular field plates, and upon an application of voltage between the first and second principal electrodes, capacities being formed between the conductive field plate and the resistive field plate.
2. The high withstand voltage semiconductor device according to claim 1, wherein the plurality of the circular field plates of the resistive field plate are arranged in concentric.
3. The high withstand voltage semiconductor device according to claim 2, wherein said conductive field plate has its floating islands in concentric arrangement right above the spaces defined between the plurality of adjacent circular field plates of the resistive field plate.
4. The high withstand voltage semiconductor device according to

claim 3, wherein each of the floating islands of the conductive field plate occupies an area corresponding to two or more of the spaces defined between adjacent ones of the circular field plates of the resistive field plate.

5. The high withstand voltage semiconductor device according to claim 1, wherein the resistive field plate is shaped in vortex.

6. The high withstand voltage semiconductor device according to claim 5, wherein the conductive field plate is shaped in vortex orbiting right above spaces defined between adjacent circular extensions of the resistive field plate and is divided in sections.

7. The high withstand voltage semiconductor device according to claim 1, wherein said substrate is SOI (Silicon on Insulator) substrate.

8. The high withstand voltage semiconductor device according to claim 1, wherein said substrate is ordinary silicon substrate.

9. A high withstand voltage semiconductor device, comprising:  
a vertical semiconductor device having first and second principal electrodes in first and second major surfaces of a semiconductor substrate so as to let primary current flows between the first and second principal electrodes, and  
a terminating region including

(i) a field electrode provided in an outer circumferential area in the first major surface of the semiconductor substrate, being spatially isolated in a direction parallel to the major surfaces of the substrate from the first principal electrode,

(ii) a field insulation film formed inside from the field electrode in the semiconductor substrate to surround the first principal electrode,

(iii) a resistive field plate formed in an upper surface of the field insulation film to surround the first principal electrode and sectioned in a plurality of circular field plates in an approximate circular arrangement orbiting gradually from the vicinity of the first principal electrode toward the field principal electrode, the innermost one of the circular field plates being electrically connected to the first principal electrode while the outermost one is electrically connected to the field electrode, and the resistive field plate including coupling field plates which

respectively connect adjacent ones of the circular field plates, and

(iv) a conductive field plate shaped like floating islands right above spaces defined between pairs of the adjacent circular field plates, an interlayer insulation film being interposed between the conductive field plate and the resistive field plate or the circular field plates, and upon an application of voltage between the first principal electrode and the field electrode, capacities being formed between the conductive field plate and the resistive field plate.

10. The high withstand voltage semiconductor device according to claim 9, wherein said plurality of circular field plates are in concentric arrangement.

11. The high withstand voltage semiconductor device according to claim 10, wherein the conductive field plate has its floating islands in concentric arrangement right above the spaces defined between adjacent circular field plates of the resistive field plate.

12. The high withstand voltage semiconductor device according to claim 9, wherein the conductive field plate is shaped in vortex orbiting right above spaces defined between adjacent circular extensions of the resistive field plate and is divided in sections.